

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Art Unit: 2137

Trent J. Brundage

Confirmation No.: 8219

Application No.: **09/854,408**

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For: DIGITAL WATERMARKING  
APPARATUS, SYSTEMS AND  
METHODS

Examiner: T. Teslovich

Date: May 18, 2006

**REPLY BRIEF**

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Sir:

This Reply Brief responds to the Examiner's Answer mailed March 21, 2006.

We respectfully renew our request of the Board of Patent Appeals and Interferences (hereafter referred to as "the Board") to reverse the outstanding final rejection of the pending claims.

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**GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

1. Claims 21-26 stand finally rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 5,113,445 (hereafter referred to as “the Wang patent”) in view of assignee’s U.S. Patent No. 5,862,260 (hereafter referred to as “the Rhoads patent”).
2. Claims 1-20 and 27-28 stand finally rejected under 35 U.S.C. § 103 as being unpatentable over the Wang patent in view of the Rhoads patent and in further view of U.S. Patent No. 6,282,528 (hereafter referred to as “the Schaffer patent”).

**REPLY**

We have grouped our responses according to the above grounds of rejection. We respectfully request that the final rejection of the pending claims be reversed.

***Rejections under 35 U.S.C. § 103 over the Wang Patent in view of the Rhoads Patent*****Claim 21**

*The proposed combination of the Wang patent and the Rhoads patent do not teach or suggest all of the limitations of claim 21.*

Independent claim 21 recites – in combination with various features – a robot to handle items. An item includes a machine-readable code provided on a surface thereof; the machine-readable code includes an orientation component.

The robot includes electronic processing circuitry, memory, and executable instructions to determine from analyzed image data an orientation of the item relative to the orientation component.

Position information is provided based on a determined orientation of the item.

The Examiner's Answer concedes that the Wang patent is silent with respect to orientation or position information associated with an encoded 2-D graphic. *Please see the Examiner's Answer, page 19, lines 5-8.*

Moreover, the Examiner's Answer states that the Wang patent: "fails to teach [that] . . . an orientation contained within the watermark is used to determine the orientation of a part." (*underlining added*). *Please see the Examiner's Answer, page 19, lines 6-8.*

Indeed, the Wang patent seems concerned with carrying data and not determining an orientation or position information. *Please see, e.g., the Wang patent at Col. 2, lines 53-55; Col. 3, lines 27-31 and Col. 6, lines 43-47.*

The relied upon passages of the Rhoads patent (Col. 72, lines 43-59; Col. 90, lines 54-66 and Col. 95, lines 5-10) do not teach or suggest determining from analyzed image data *an orientation of the item relative to the orientation component, and providing position information based on a determined orientation of the item*, in the context of claim 21.

For example, the cited Col. 95 section of the Rhoads patent – including a discussion of automobile and airline parts – is concerned with security or thwarting counterfeiting. Industrial parts are steganographically marked to provide an inconspicuous identification tag (Col. 95, lines 9-11).

And while the cited Col. 72, lines 43-59, section does describe some examples of an orientation component covered by claim 21, this section does not discuss using orientation components as contemplated by claim 21. For example, there is no mention in the cited sections of the Rhoads patent of determining an orientation of an item (e.g., a part) to provide physical position information associated with the item, in combination with other features of claim 21.

Thus, even if the cited sections are combined as suggested, the resulting combination would not yield applicant's claimed invention (claim 21), including instructions to determine an orientation of a marked item relative to an orientation component, and to provide position information based on a determined orientation of the item, in combination with the other features of claim 21.

*The motivation to combine the Wang patent with the Rhoads patent is deficient.*

We disagree with the motivation to combine as applied in the Examiner's Answer on page 6, lines 3-7 and page 21, lines 1-11.

The Examiner's Answer asserts that one reason to combine the Rhoads patent with the Wang patent is to "allow for an increase in the amount of data encoded onto the label that can be quickly and easily decoded and used to control the orientation, rotation, and translation of said parts." (*underlining added*). See page 6, lines 5-6.

But please recall that claim 21 recites a machine-readable code including an orientation component. It is this orientation component - in contrast to using only a Wang barcode payload (e.g., encoded data) – that is used to determine an orientation of an item. We refer the Board to the specification (e.g., page 2, lines 16-21<sup>1</sup> and the last two lines of page 5 – page 6, line 2<sup>2</sup>) for a related discussion.

The specification teaches that a machine-readable code (e.g., a digital watermark) includes a data carrying component (e.g., a payload) **and** an orientation signal component. Signal characteristics of the orientation component – and not only an encoded payload – are used to determine signal orientation attributes. See, e.g., Figs. 4A-4C and page 4, line 19 – page 5, line 14 of the specification.

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1 "The digital watermark can include an orientation or grid signal and a data payload. The grid signal can be used to determine the orientation and location of the image, and hence, the orientation and location of the item. The data payload can be used to carry any desired digital data. The ability to detect and read digital watermarks gives an automation system advantages over prior automation systems."

2 "The watermark can include payload data that provides other information. For example the grid signal on the watermark can be used to tell the system the orientation of a part and the payload data in the watermark can be a serial number of part number that insures that the correct part has been placed on the circuit board."

A need to increase data carrying capacity for a label would not lead one to use signal characteristics associated with an orientation component, as in the context of claim 21, to help determine position information associated with an item.

And we do not find the motivation discussed on page 21 of the Examiner's Answer persuasive. For example, while deserved accolades are given to the Rhoads patent for its wealth and depth of teachings in digital watermarking (see lines 8-11), there is no discussion of why one of ordinary skill would need or want to modify a Wang patent barcode-dependent system to include orientation components as discussed in the Rhoads patent.

We respectfully request that the final rejection of claim 21 be reversed.

*We respectfully disagree with the interpretation of the Wang patent in the Examiner's Answer.*

The Examiner's Answer implies that a Wang barcode is used to control placement of patterns on street signs. Please see the Examiner's Answer, last 3 lines of page 19 (citing the Wang patent at Col. 6, lines 15-27).

We, however, do not read this passage to teach controlling positional placement of barcodes on signs (e.g., using a barcode to instruct a machine where to place a barcode on the sign). Rather, we read the Wang passage as saying that roadway signs may include two-dimensional patterns (e.g., "barcodes") placed thereon that are read by passing cars for use with on-board computers. While the passing cars may be interested in geographical information contained in the barcodes, we submit that they are much less likely to be interested in the orientation position of the sign itself.

Thus, this passage is not helpful in teaching or suggesting instructions to determine from analyzed image data *an orientation of the item relative to the orientation component, and to provide position information based on a determined orientation of the item.*

The Examiner's Answer suggests that a Wang barcode is used to control a computer which in turn controls machining of a part according to a control program. Please see the

Examiner's Answer, last 5 lines of page 19 (citing the Wang patent at Col. 6, lines 15-27).

Here again, we do not see any mention in this passage of a barcode conveying orientation information concerning the part.

And we respectfully point out what we believe is a typographical error on page 19, lines 15-18, of the Examiner's Answer. We think the Examiner intended to cite the Wang patent instead of citing the Rhoads patent. Please see page 19, line 16.

We respectfully request that the final rejection with respect to claim 21 be reserved.

***Rejections under 35 U.S.C. § 103 over the Wang Patent in view of the Rhoads Patent in further view of the Schaffer patent***

Claim 1

*We respectfully disagree with the interpretation of the Wang patent in the Examiner's Answer – we do not think it teaches what the Examiner's Answer suggests that it teaches.*

The Wang patent does not recite a grid signal as contemplated in claim 1, contrary to the suggestion in the Examiner's Answer on page 24, lines 12-15. Please recall that claim 1 recites a grid signal from which an angular rotation can be determined. The cited Wang passages are silent in this regard. The Wang patent is also not understood to discuss controlling placement of parts in relation to other parts. *But cf.* the Examiner Answer on page 24, lines 14-15.

In fact, we were surprised to see these assertions given the acknowledgement<sup>3</sup> of the Wang patent's deficiencies in the Examiner's Answer.

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<sup>3</sup> "Wang fails to teach the placement of a first part on a second part wherein the first part contains a 'machine-readable graphic image' comprised of a digital watermark and wherein the data contained therein is used to determine the angular rotation of at least one of the parts."

Please see page 8, lines 4-7, of the Examiner's Answer.

We do not read Col. 6, lines 23-27, of the Wang patent to teach controlling positional placement of barcodes on signs (e.g., using a barcode to instruct a machine where to place the barcode on the sign). Rather, we read this passage as discussing roadway signs including two-dimensional patterns (e.g., “barcodes”) placed thereon that are read by passing cars for use with on-board computers. While the passing cars may be interested in geographical information contained in the barcodes, we submit that they are much less likely to be interested in the orientation position of the sign itself.

Nor do we understand a discussion of prompting – via a barcode instruction –machining a part in accordance with a control program to teach or suggest placement of one part in relation to other parts. *But cf.* the Examiner’s Answer, page 24, lines 5-9 and 14-15.

*The motivation to combine the Wang patent with the Rhoads patent and the Schaffer patent is deficient.*

We again disagree with the motivation to combine the Wang patent with the Rhoads patent as suggested in the Examiner’s Answer on page 25, lines 2-19, for at least reasons analogous to those noted above with respect to claim 21.

We further disagree that it would be obvious to combine the Schaffer patent as suggested.

The Schaffer patent is cited as teaching a vision alignment system, but Schaffer is not understood to teach or suggest an inconspicuous digital watermark including a grid signal. Schaffer instead uses visible hashes (see Figs. 2A and 10). In fact, the Schaffer patent alignment seems directly dependent on detection of these visible hashes.

The cited passages of the Schaffer patent have no teaching or suggestion to modify its embodiments to handle invisible codes including orientation components.

And, as discuss above with respect to claim 21, increasing data capacity of a label is not an important motivator here. Rather, focus should be on a digital watermark including a grid signal as recited in claim 1.

We respectfully request that the final rejection of claim 1 be reversed.



Claims 12-16

Independent claim 12 recites the following:

12. *A robot for handling items, said robot including,  
a camera for acquiring an electronic image of a digital watermark,  
a computer including a program for reading a digital watermark in an electronic image  
acquired by said camera,  
a controller for controlling said robot in response to orientation data acquired from said  
digital watermark, said controller controlling positioning or movement of an item including the  
digital watermark.*

A new ground of rejection was presented in the Examiner's Answer. We provide our response below.

Claim 12 recites a controller for controlling a robot in response to orientation data acquired from a digital watermark. The controller controls positioning or movement of an item including the digital watermark.

The Wang patent fails to teach or suggest a controller that is responsive to orientation data acquired from a digital watermark. The Examiner's Answer's agrees. Please see the Examiner's Answer on page 13, lines 6-8.

The Wang patent also fails to teach or suggest that the controller controls positioning or movement of an item including a digital watermark.

The cited passages from the Rhoads patent do not discuss controlling a robot in response to orientation data acquired from a digital watermark, wherein the controller controls position or movement of an item including the digital watermark. Instead, the cited Col. 95, lines 6-11, passage deals with object security, e.g. thwarting piracy.

The Schaffer patent is cited as teaching a vision alignment system, but Schaffer is not understood to teach or suggest a system responsive to digital watermark orientation data.

And we respectfully submit that there is no hint or suggestion in any of the documents to make necessary modifications to the Wang or Schaffer patents to handle digital watermarks

including orientation data to control positioning or movement of an item including a digital watermark – especially since the cited passages from the primary reference (the Wang patent) and the secondary reference (the Rhoads patent) do not even discuss such orientation-based handling.

We respectfully find the stated motivation to combine these three documents lacking (please see the Examiner's Answer, page 14, lines 1-5). Instead of increasing the data carrying capacity of a label, there should be some contemplation in Wang and Rhoads of controlling positional movement (or controlling robots concerned with positioning or movement) through orientation data of a hidden code (e.g., digital watermark) in order to combine as suggested.

Increasing data capacity of a label is not an important motivator here. Rather, focus should be on a digital watermark including signal characteristics that allow an orientation to be determined there from.

We respectfully request that the final rejection of claim 12 be reversed.

#### Claim 17

The Wang patent fails to teach or suggest a method to control placement of a first part on a second part or that the first part includes steganographic encoding redundantly provided thereon, with the steganographic encoding including an orientation component. The Wang patent also fails to teach or suggest determining an orientation of the first part through reference to at least the orientation component of the steganographic encoding.

The cited passages from the Rhoads patent are not understood to discuss placement of a first part on a second part through reference to at least the orientation component of the steganographic encoding. Instead, the cited Col. 95 passage deals with object security, e.g., thwarting piracy.

The Schaffer patent is cited as teaching a vision alignment system, but Schaffer is not understood to teach or suggest steganographic encoding including an orientation component. There is no hint or suggestion in any of the documents to make necessary modifications to the

Schaffer patent to handle invisible codes or steganographic orientation components for placement of a first part on a second part – especially since the cited passages from the primary reference (the Wang patent) and the secondary reference (the Rhoads patent) do not even discuss placement of a first part on a second part.

Again, we find the stated motivation lacking. See the Examiner's Answer on page 16, lines 12-16. Recall that claim 17 recites steganographic encoding including an orientation component. It is this orientation component - in contrast to using only a Wang barcode payload (e.g., encoded data) – that is used to determine an orientation of an item. We respectfully refer the Board to the specification (e.g., page 2, lines 16-21<sup>4</sup> and the last two lines of page 5 – page 6, line 2<sup>5</sup>) for a related discussion.

The specification teaches that a steganographic signal includes a data carrying component (e.g., a payload) **and** an orientation signal component. Signal characteristics of the orientation component – and not an encoded payload – are used to determine signal orientation attributes. See, e.g., Figs. 4A-4C and page 4, line 19 – page 5, line 14 of the specification.

A need to increase data carrying capacity for a label would not lead one to use signal characteristics associated with an orientation component, as in the context of claim 17, to help control placement of a first part on a second part.

We respectfully request that the final rejection of claim 17 be reversed.

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4 “The digital watermark can include an orientation or grid signal and a data payload. The grid signal can be used to determine the orientation and location of the image, and hence, the orientation and location of the item. The data payload can be used to carry any desired digital data. The ability to detect and read digital watermarks gives an automation system advantages over prior automation systems.”

5 “The watermark can include payload data that provides other information. For example the grid signal on the watermark can be used to tell the system the orientation of a part and the payload data in the watermark can be a serial number of part number that insures that the correct part has been placed on the circuit board.”

**CONCLUSION AND REQUEST FOR REVERSAL**

We invite the Board to consider our remarks in our earlier filed Appeal Brief for any claim not specifically addressed in this Reply.

The claims are believed patentable over the applied patents.

Appellant respectfully requests that the Board reverse the final rejection of the pending claims.


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Respectfully submitted,

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